

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of:

**A. Rosenthal, C. Freiberg, X.P. Perret and W.J. Broughton**

Serial No.: 09/214,808

Group No.: 1652

Filed: June 22, 1999

Examiner: M. Rao

For: **GENOMIC SEQUENCE OF *RHIZOBIUM* SP. NGR234 SYMBIOTIC  
PLASMID**

I, Ellen M. Klann, Registration No. 44,836 certify that this correspondence is being deposited with the U.S. Postal Service as First Class mail in an envelope addressed to the Assistant Commissioner of Patents and Trademarks, Washington, D.C. 20231.

On 27 August 2001

Ellen M. Klann

Ellen M. Klann Reg. No. 44,836

Assistant Commissioner for Patents  
Washington, D.C. 20231.

Dear Sir,

**REQUEST FOR RECONSIDERATION**

This responds to the Office Action dated February 27, 2001. A petition for a three-month extension of time and the appropriate fee accompany this response.

Claims 3-6, 19-21, and 23-27 were pending. All pending claims were rejected in the Office Action. In view of the arguments and amendments that follow, Applicants respectfully request withdrawal of the rejections upon reconsideration.

**In the claims:**

Please cancel claims 5 and 21 without prejudice.

Please amend the claims as follows:

3. (twice amended) An open reading frame (ORF) derived from the nucleotide sequence of SEQ ID NO: 1 at nucleotide base numbers 142,026 to 143,234 and degenerate variants thereof.
6. (twice amended) The ORF of claim 3 which is under the control of its natural regulatory elements.
19. (twice amended) A plasmid which harbours the ORF of claim 3 or any degenerate variant thereof which encodes the protein of claim 28.

Please add claim 28.

28. (new) A protein expressible from the ORF of claim 3.

Remarks**I. Claim Amendments**

Claims 3, 4, 6, 19-20, and 23-28 remain in this application. Claims 5 and 21 have been cancelled. Claims 3, 6 and 19 have been amended. Claim 28 has been added.

Claims 5 and 21 have been cancelled as being drawn to embodiments not presently of interest to Applicants. Applicants reserve the right to pursue the subject matter of this claim in a continuing application.

Claim 3 has been amended to delete “degenerate variants ... [of the nucleotide sequence of SEQ ID NO: 1] which have been altered by mutation, deletion or insertion.” Applicants have filed a continuing application to pursue this subject matter.

Attached hereto is a marked-up version of the changes made to the specification and the claims by the current amendment. The attached page is captioned **“Version with markings to show changes made.”**

Claim 3 has been objected to due to the recitation of the term “ORF” without expanding it where it first occurs. Claim 3 has been amended to recite “open reading frame (ORF).”

Claims 3 and dependent claim 5 have been objected to because the nucleotide position numbers of the open reading frames are not recited in the claims.

Claim 3 has been amended to recite “the nucleotide sequence of SEQ ID NO: 1 at nucleotide base numbers 142,026 to 143,234.” Claim 5 has been cancelled.

New claim 28 is identical to claim 11 which was inadvertently cancelled in the Response of January 12, 2001. Claim 19 was amended to change its dependency from claim 11 to claim 28. Applicants elected to prosecute the claims of Group II, which the Examiner indicated were directed to the polynucleotide of SEQ ID NO: 1 **and its use**. Applicants respectfully submit that proteins expressible from the ORF derived from the nucleotide sequence of SEQ ID NO: 1 at nucleotide base numbers 142,026 to 143,234 and degenerate variants thereof should be examined with the pending claims as these proteins are prepared upon use of the ORF of claim 3. Additionally, Applicants respectfully submit that it would not be unduly burdensome for the Examiner to include new claim 28 in the examination, particularly as a search has not yet been conducted.

## **II. Rejections under 35 USC § 112, Second Paragraph**

Claim 3 has been rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite in the recitation of “derivable from.” As the Examiner suggested, claim 3 has been amended to recite “derived from” in the place of “derivable from.”

Claim 3 has also been rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite in the recitation of the phrase “SEQ ID NO: 1 and degenerate variants thereof” twice. As the Examiner suggested, claim 3 has been amended to recite “SEQ ID NO: 1 and variants thereof” only once.

Claim 4 has been rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite in the recitation of “proteins of amino acid metabolism.” Applicants conclude that the Examiner is actually addressing claim 5, which recites “proteins of amino acid metabolism”, in this rejection. Claim 5 has been cancelled.

Claim 4 has been rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite in the recitation of the phrase “such as.” Here again, Applicants conclude that the Examiner is addressing claim 5, which recites “such as”, in this rejection. Claim 5 has been cancelled.

Claim 6 has been rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite in the recitation of the phrase “analogues to such natural regulatory elements.” Claim 6 has been amended to remove this phrase.

In view of the foregoing, Applicants respectfully request that the rejections under 35 U.S.C. § 112, second paragraph be withdrawn.

### **III. Rejections under 35 USC § 112, First Paragraph**

Claims 3 and 19, and dependent claims 6 and 20-27, have been rejected under 35 U.S.C § 112, first paragraph, as allegedly the specification does not reasonably provide enablement for any ORF derived from a variant of DNA from SEQ ID NO: 1. Applicants traverse this rejection. The scope of amended claims 3 and 19 is fully enabled by the specification.

Amended claim 3 now recites degenerate variants of the ORF, and no longer recites degenerate variants altered by mutation, deletion or insertion. Support for

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this amendment is found in the specification on page 8, lines 3-5. The term “degenerate” was known to those of skill in the art at time of filing to mean “that several codons can specify the same amino acid” (*Genes and Genomes*, M. Singer and P. Berg, 1991, University Science Books, Mill Valley CA, page 132; attached). One of skill in the art would therefore understand a “degenerate variant” of an ORF to mean a variant ORF that encoded the same protein sequence but with at least one degenerate codon. Degenerate variants can be determined by using only the genetic code, which was well established at time of filing. Modifications of the nucleic acid sequence using degenerate codons have predictable results and require no subsequent screening. Therefore, no experimentation at all would be required for the skilled artisan to make “degenerate variants” of the ORF at nucleotide base numbers 142,026 to 143,234 of SEQ ID NO: 1.

The Office Action asserts that the degenerate variants of the invention as then claimed may not have the desired functions. Since a “degenerate variant” of an ORF would encode the same protein as the disclosed ORF, the structural and functional properties of the protein encoded by the degenerate variant will be the same as that encoded by the disclosed ORF. Therefore, degenerate variant ORFs can be used for the same recombinant protein preparations as the disclosed ORF without further experimentation.

Claims 3 and 19, and dependent claims 5-6 and 20-27, have been rejected under 35 U.S.C. § 112, first paragraph, as allegedly a genus of DNA molecules with either SEQ ID NO: 1 or variants of SEQ ID NO: 1 in which nucleotides have been altered

by mutation, deletion or insertion is not described in the specification. Amended claim 3 no longer recites degenerate variants altered by mutation, deletion or insertion. One of skill in the art could readily envision all the DNAs that are degenerate variants of the ORF at nucleotide base numbers 142,026 to 143,234 of SEQ ID NO: 1, and would conclude that the applicant was in possession of the full scope of the claims 3 and 19. Claim 5 has been cancelled.

In view of the foregoing, Applicants respectfully request that the rejections under 35 U.S.C. § 112, first paragraph, be withdrawn.

#### **IV. Rejections under 35 U.S.C. § 102(b)/103**

Claims 3-6, 19-21 and 23-27 have been rejected under 35 U.S.C. § 102(b) as anticipated by, or, in the alternative, under 35 U.S.C. § 103(a) as allegedly being obvious over Aguilar et al. (J. Bacteriol., 1987, 169:5393-5400) and the high level of knowledge in the art of molecular biology and biochemistry. Applicants traverse this rejection. Aguilar does not disclose or make obvious each element of the invention.

The Office Action provides no evidence that Aguilar describes a nucleic acid molecule with the sequence of the ORF at nucleotide base numbers 142,026 to 143,234 of SEQ ID NO: 1, or a protein expressible by this ORF. The Office Action asserts that the nucleotide position numbers that correspond to the ORFs were not available, therefore a search was not performed. However, this data is available in the specification in Table 1 (page 24, last line of page). Applicants request that the Examiner

perform a comparison of the ORF of claim 3 with the nucleic acid molecule described in Aguilar. Without this sequence comparison, a *prima facie* case cannot be made that Aguilar anticipates or makes obvious the ORF of claim 3.

Aguilar does not disclose or make obvious the degenerate variants of the ORF derived from the nucleotide sequence of SEQ ID NO: 1 at nucleotide base numbers 142,026 to 143,234. Amended claim 3 does not recite “degenerate variants which have been altered by mutation, deletion or insertion.” As discussed above, one of skill in the art would have understood a “degenerate variant” to be a variant that encodes the same protein as that encoded by the disclosed ORF. Aguilar does not describe a protein encoded by the ORF at nucleotide base numbers 142,026 to 143,234 of SEQ ID NO: 1, nor a nucleic acid molecule encoding this protein. Neither does Aguilar provide any motivation for one of skill in the art to transform a plant with the nucleic acid molecule described in Aguilar. Simply because one of skill **could** transform a plant with a nucleic acid molecule does not mean that the skilled artisan **would** be motivated to do so.

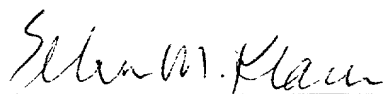
In view of the foregoing, Applicants respectfully request that the rejection under 35 U.S.C. § 102(b) or, in the alternative, 35 U.S.C § 103 be withdrawn.

Applicants state that the inventors of the application invented the subject matter of all the claims jointly.



For the foregoing reasons, Applicants submit that the present claims meet all the requirements for patentability. The Examiner is respectfully requested to allow all the present claims. If the Examiner is of a contrary view, he is requested to contact the undersigned at (215) 557-5948.

Respectfully submitted,



**Ellen M. Klann, Ph.D.**  
Registration No. 44,836

Date: 27 August 2001

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Mackiewicz and Norris LLP  
One Liberty Place - 46th Floor,  
Philadelphia, PA 19103,  
(215) 557-5948

Attachments:

*Genes and Genomes*, M. Singer and P. Berg, 1991, University Science Books,  
Mill Valley CA, pages 131-132.

VERSION WITH MARKINGS TO SHOW CHANGES MADE**In the claims:**

Claims 5 and 21 has been cancelled.

Claims 3, 6 and 19 have been amended as follows:

3. (twice amended) An open reading frame (ORF) derivable from ~~derived from~~ the nucleotide sequence of SEQ ID NO: 1 at nucleotide base numbers 142,026 to 143,234 and degenerate variants thereof, ~~or the nucleotide sequence of SEQ ID NO: 1 and degenerate variants thereof which have been altered by mutation, deletion or insertion, excluding the ORFs identified as y4aL, y4hB, y4hG, y4hH, y4hI, y4nB, y4nC, y4sM, y4vK, y4xA, y4yC, y4yD, y4yE, y4yG in Table 3.~~
6. (twice amended) The ORF of claim 3 which is under the control of its natural regulatory elements ~~or under the control of analogues to such natural regulatory elements.~~
19. (twice amended) A plasmid which harbours at least one the ORF of claim 3 or any degenerate variant thereof ~~or which harbours at least one ORF or any degenerate variant thereof which encodes at least one the~~ protein of claim 11 28.

Claim 28 has been added.

28. (new) A protein expressible from the ORF of claim 3.